

REMARKS

Applicants have amended claims 1-2, 6-9, 11-12, and 16-19 to better define the present invention. In addition, Applicants have submitted a proposed drawing change.

Examiner objected to the drawings. In particular, the Examiner stated:

Figure 1 should be designated by a legend such as –Prior Art—because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Applicants have submitted a proposed drawing correction herewith to designate FIG. 1 as Prior Art. As such, Applicants respectfully request the Examiner to withdraw this objection.

Examiner objected to the drawings. In particular, the Examiner stated:

The drawings are objected to because they fail to comply with the requirements of 37 CFR 1.84. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Applicants respectfully submits that they have reviewed the drawings and are unaware of the reason for this objection. As such, Applicants respectfully request the Examiner to withdraw this objection.

Examiner rejected claims 1-19 under 35 U.S.C. 112, second paragraph. In particular, the Examiner stated:

Claims 1-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims are indefinite because it is not clear what is referenced as a byproduct of the process and how it is different from the products of the cleaning process.

Claims 1-10 are indefinite because it is not clear what is referenced as “a measure of absorbance of the radiation” and how can the “measure” be detected.

Claims 1-19 are also indefinite because how can the “radiation absorbed by a byproduct” be directed to an exhaust line.

Claims 1-10 are further indefinite because it is not clear what is referenced as a "predetermined window". For claim 2 it is further not clear how can this window correspond to cleaning the chamber and the exhaust line.

Claim 2 is indefinite because it is not clear how can the specified by this claim "predetermined window" be known for the specific cleaning process. Does the method require additional steps, such as calibrating the controller prior to actual cleaning process? How can the points corresponding to 100% of chamber cleaning and 100% of the exhaust line cleaning be determined or assumed having only absorbance data?

Claims 7-10 are indefinite because they contradict to claim 1, which require a different step for the same purpose of detecting endpoint. As the result, it is not clear how the endpoint should be determined.

Claim 8 is indefinite because it is not clear how this claim limits the subject matter of the preceding claim. This claim fails to recite any new processing step or specify the step recited by the preceding claim.

Claims 11-19 are indefinite because it is not clear what is referenced as "a measure of a background radiation".

Claims 11-19 are indefinite because it is not clear how can the analyzer determines a measure of absorbance from the further radiation and background radiation.

Claims 11-19 are further indefinite because it is not clear what is meant under "the measure to determine a measure of absorbance".

Claims 11-19 are indefinite and incomplete because they omit essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: between the detector, the analyzer and the controller.

Claim 12 is indefinite and/or incomplete because it is not clear what structure enables determination the points corresponding 100% of chamber cleaning and 100% of the exhaust line cleaning.

Claim 14 is indefinite because the term "close" is a relative term lacking proper comparative basis.

Claim 16 is indefinite because it is not clear which "measure" of the "measures" recited by the previous claims is meant.

Claims 17-19 are indefinite because they contradict to claim 11, which require different actions of the controller for the same purpose of detecting endpoint. As the result, the structure of the controller is not clear.

Applicants have amended claims 1-2, 6-9, 11-12, and 16-19 to better define the present invention. As such, Applicants respectfully traverse the Examiner's rejection.

The Examiner stated "The claims are indefinite because it is not clear what is referenced as a byproduct of the process and how it is different from the products of the cleaning process." However, Applicants have examined the claims, and Applicants respectfully submit that they have used the term "byproduct of the cleaning process" in independent claims 1-2 and 11-12. Thereafter, in these claims, and in dependent claims, the Applicants have used the term

“the byproduct” for which the term “byproduct of the cleaning process” is antecedent basis. As such, Applicants respectfully submit that the claims are not indefinite.

Regarding claims 1-10: Examiner stated “Claims 1-10 are indefinite because it is not clear what is referenced as “a measure of absorbance of the radiation” and how can the “measure” be detected.” Applicants respectfully submit that the term “a measure of absorbance of the radiation” is described in the specification at p. 7, line 11. Further, Applicants respectfully submit that a method for detecting the measure is set forth in detail in the specification at p. 5, line 21 to p. 7, line 12. As such, Applicants respectfully submit that claims 1-10 are not indefinite.

Regarding claims 1-19: Examiner stated “Claims 1-19 are also indefinite because how can the “radiation absorbed by a byproduct” be directed to an exhaust line.” Applicants respectfully direct the Examiner’s attention to FIG. 3 and the specification at p. 5, lines 24-30 which describe in detail directing radiation absorbed by a byproduct of the cleaning process. As the Examiner can readily appreciate from this, the term “radiation absorbed by a byproduct” means radiation having wavelengths that are absorbed by the byproduct, and as such, the term provides a definition of the type of radiation utilized. As such, Applicants respectfully submit that claims 1-19 are not indefinite.

Regarding claims 1-10: Examiner stated “Claims 1-10 are further indefinite because it is not clear what is referenced as “predetermined window.” Applicants respectfully submit that the term “a predetermined window” is explained in detail in the specification at p. 8, lines 9-20. As such, Applicants respectfully submit that claims 1-10 are not indefinite.

Regarding claim 2: Examiner stated “Claim 2 is indefinite because it is not clear how can the specified by this claim “predetermined window” be known for the specific cleaning process. Does the method require additional steps, such as calibrating the controller prior to actual cleaning process? How can the points corresponding to 100% of chamber cleaning and 100% of the exhaust line cleaning be determined or assumed having only absorbance data?” Applicants respectfully submit that the term “a predetermined window” is explained in the specification at p. 8, lines 9-20, and Applicants respectfully submit that the manner in which the predetermined window relates to cleaning the chamber and a predetermined portion of the

exhaust line is explained in the specification at p. 8, lines 1-23 and p. 7, lines 10-30. Lastly, Applicants respectfully submit that a method for determining the predetermined window for a particular chamber cleaning process is described in the specification at p. 8, line 29 to p. 9, line 17.

Further, Applicants respectfully submit that claim 2 is not required to set forth how the predetermined window is determined in order for claim 2 to meet the requirements of 35 U.S.C. 112, paragraph 2. Instead, under 35 U.S.C. 112, paragraph 1, all that is required is that the specification teach one of ordinary skill in the art how to make and use the invention. In other words, Applicants respectfully submit that claims are not required to enable an invention, the specification enables the invention. As such, Applicants respectfully submit that claim 2 is not indefinite.

Regarding claims 7-10: Examiner stated “Claims 7-10 are indefinite because they contradict to claim 1, which requires a different step for the same purpose of detecting endpoint. As the result, it is not clear how the endpoint should be determined.” Applicants have amended claim 7 to make it clear how the endpoint should be determined. As such, Applicants respectfully submit that claims 7-10 are not indefinite.

Regarding claim 8: Examiner stated “Claim 8 is indefinite because it is not clear how this claim limits the subject matter of the preceding claim. This claim fails to recite any new processing step or specify the step recited by the preceding claim.” Applicants have amended claim 8 to clearly show how this claim limits the subject matter of its antecedent claim 6. As such, Applicants respectfully submit that claim 8 is not indefinite. ✓

Regarding claims 11-19: Examiner stated “Claims 11-19 are indefinite because it is not clear what is referenced as a “measure of a background radiation”.” Applicants have amended claim 11 so that the term “measure of background radiation” does not appear. However, Applicants have amended claims 1 and 2 so that the term “measure of background radiation” does appear. However, Applicants respectfully submit that the term “measure background radiation” would be readily understood by one of ordinary skill in the art in light of description in the specification at p. 6, lines 2-16. As such, Applicants respectfully submit that neither claims 1-2 nor claims 11-19 are indefinite.

Regarding claims 11-19: Examiner stated “Claims 11-19 are indefinite because it is not clear how can the analyzer determines a measure of absorbance from the further radiation and background radiation.” Applicants respectfully submit that the specification at p. 6, lines 11-23 describes in detail how can the analyzer determines a measure of absorbance from the further radiation and background radiation. As such, Applicants respectfully submit that claims 11-19 are not indefinite.

Regarding claims 11-19: Examiner stated “Claims 11-19 are indefinite and incomplete because it is not clear what is meant under “the measure to determine a measure of absorbance.” Applicants have amended claim 11 so that this term does not appear. As such, Applicants respectfully submit that claims 11-19 are not indefinite.

Regarding claims 11-19: Examiner stated “Claims 11-19 are indefinite and incomplete because they omit essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: between the detector, the analyzer and the controller.” Applicants have amended claim 11 to provide structural cooperative relationships among the detector, the analyzer and the controller. As such, Applicants respectfully submit that claims 11-19 are not indefinite.

Regarding claim 12: Examiner stated “Claim 12 is indefinite and/or incomplete because it is not clear what structure enables determination of the points corresponding 100% of chamber cleaning and 100% of the exhaust line cleaning.” Applicants have amended claim 12 to make clear that the predetermined window encompasses a point that corresponds to 100% of chamber cleaning and less than 100% cleaning of a predetermined portion of the exhaust line. Further, Applicants respectfully submit that in claim 12 the controller determines when the measure of absorbance falls within the predetermined window. As such, Applicants respectfully submit that claim 12 is not indefinite.

Regarding claim 14: Examiner stated “Claim 14 is indefinite because the term “close” is a relative term lacking proper comparative basis.” Applicants respectfully submit that the term close is described in detail in the specification at p. 6, lines 5-8. Further, Applicants respectfully submit that the term close would be readily understood by one of ordinary skill in the

art as being sufficiently close to the further radiation to be able to provide a suitable estimate of background. As such, Applicants respectfully submit that claim 14 is not indefinite.

Regarding claims 16: Examiner stated "Claim 16 is indefinite because it is not clear which "measure" of the "measures" recited by the previous claims is meant." Applicants have amended claim 16 to make clear that to which the term "measure" relates. As such, Applicants respectfully submit that claims 11-19 are not indefinite.

Regarding claims 17-19: Examiner stated "Claims 17-19 are indefinite because they contradict to claim 11, which require different actions of the controller for the same purpose of detecting endpoint. As the result, the structure of the controller is not clear." Applicants have amended claims 11 and 18 to make the structure of the controller clear. As such, Applicants respectfully submit that claims 11-19 are not indefinite.

Examiner rejected claims 11-19 under 35 U.S.C. 102(b). In particular, the Examiner stated:

Claims 11-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Hao (US Patent No 5,966,586).

Hao teaches an apparatus having the claimed structure. See entire reference, especially, Figures 3, 4a and column 2, and 5-10. The apparatus of Hao is fully capable of performing all the claimed functions.

Applicants respectfully traverse the Examiner's rejection.

Applicants respectfully submit that Hao teaches determining an etching endpoint for a plasma processing chamber that has an exhaust port through which byproducts of the etching process are exhausted. As taught by Hao, a light source projects a beam of light through the exhaust port, after which light in the beam is detected by a light detector. The light has a wavelength that is at least partially absorbed by one of the byproducts of the plasma etching process. As set forth at col. 8, lines 7-19:

When certain compounds or reactants making up the byproducts of the etching process are exhausted through exhaust port 130, specific compounds or reactants which absorb light of the given wavelength absorb a portion of the beam of light passing through exhaust port 130. The remaining portion of the beam of light passes through window 308 to light detector 304. Light detector

304 detects the intensity of this remaining portion of the beam of light and outputs a signal, indicated by arrow 312. The relative strength of this output signal represents the density of compounds or reactants that are capable of absorbing the given wavelength of light generated by light source 302. (Emphasis added)

Hao then teaches that a controller circuit or computer uses signal 312 to ascertain a predefined density criteria for terminating the etch process. Hao refers to col. 6 to discuss such predefined criteria. For example, Hao sets forth the following at col. 6, lines 7-9: "This predefined density criteria indicates a change in the compounds making up the byproducts of the etching process." Further, Hao sets forth the following at col. 6, lines 16-21: "Alternatively, if the etching process begins to etch into an underlying layer of the wafer formed from a different material, the reaction product species will begin to change. These changes may be reflected in a predefined density criteria to ascertain, from variable signal 206, when to terminate the etch." Still further, Hao sets forth the following at col. 6, lines 27-36: "By way of example, a control signal may be outputted when the density threshold of a given compound is detected (such as when the density of the byproduct decreases to a certain threshold or when the density of the etching source gas increases to a certain threshold). As another example, the control signal may be outputted when the change (either increase or decrease) in the density of a predefined compound reaches a certain level. As yet another example, the control signal may be outputted when the shape of variable signal 206 matches a predetermined shape."

Regarding claim 11: Claim 11 requires "a detector that selects further radiation emitted by the byproduct in response to the radiation and outputs a first radiation signal and selects background radiation in the exhaust line and outputs a second radiation signal." As the Examiner can readily appreciate from the above, Hao only teaches a detector that "detects the intensity of this remaining portion of the beam of light and outputs a signal, indicated by arrow 312." As such, the detector of Hao does not select "further radiation emitted by the byproduct" as required by claim 11, and the detector of Hao does not select "background radiation" as required by claim 11. As such Applicants respectfully submit that Hao does not anticipate claim 11.

Regarding claim 12: Applicants respectfully submit that claim 12 requires “a detector that selects further radiation emitted by the byproduct in response to the radiation and outputs a first radiation signal and selects background radiation in the exhaust line and outputs a second radiation signal.” As such, Applicants respectfully submit that Hao does not anticipate claim 12 for the same reasons set forth above with respect to claim 11. In addition, claim 12 requires “the predetermined window encompasses a value that corresponds to 100% cleaning of the chamber and less than 100% cleaning of a predetermined portion of the exhaust line.” Hao does not teach, hint or suggest such a predetermined window for a measure of absorbance. As such Applicants respectfully submit that Hao does not anticipate claim 12.

Regarding claim 13: Applicants respectfully submit that claim 13 depends from claim 12. As such, Applicants respectfully submit that Hao does not anticipate claim 13 for the same reasons set forth above with respect to claim 12. In addition, claim 13 requires “the cleaning process is a dark cleaning process” and “the radiation source comprises a source of infrared radiation.” Hao does not teach, hint or suggest such a dark cleaning process or a source of infrared radiation. As such Applicants respectfully submit that Hao does not anticipate claim 13.

Regarding claim 14: Applicants respectfully submit that claim 14 depends from claims 12-13. As such, Applicants respectfully submit that Hao does not anticipate claim 14 for the same reasons set forth above with respect to claims 12-13. In addition, claim 14 requires that “the detector comprises a filter that transmits the further radiation and a filter that transmits radiation in a band of wavelengths close to wavelengths of the further radiation.” Hao does not teach, hint or suggest a filter that transmits the further radiation or a filter that transmits radiation in a band of wavelengths close to wavelengths of the further radiation. As such Applicants respectfully submit that Hao does not anticipate claim 14.

Regarding claim 15: Applicants respectfully submit that claim 15 depends from claims 12-14. As such, Applicants respectfully submit that Hao does not anticipate claim 15 for the same reasons set forth above with respect to claims 12-14. In addition, claim 15 requires that “the analyzer comprises a Fourier Transform Raman spectrometer.” Hao does not teach, hint or

suggest such an analyzer. As such Applicants respectfully submit that Hao does not anticipate claim 15.

Regarding claim 16: Applicants respectfully submit that claim 16 depends from claims 12-15. As such, Applicants respectfully submit that Hao does not anticipate claim 15 for the same reasons set forth above with respect to claims 12-15.

Regarding claim 17: Applicants respectfully submit that claim 17 depends from claims 12-16. As such, Applicants respectfully submit that Hao does not anticipate claim 17 for the same reasons set forth above with respect to claims 12-16.

Regarding claim 18: Applicants respectfully submit that claim 18 depends from claims 12-17. As such, Applicants respectfully submit that Hao does not anticipate claim 18 for the same reasons set forth above with respect to claims 12-17.

Regarding claim 19: Applicants respectfully submit that claim 19 depends from claims 12-18. As such, Applicants respectfully submit that Hao does not anticipate claim 19 for the same reasons set forth above with respect to claims 12-18. In addition, claim 19 requires that "the byproduct is SiF₄." Hao does not teach, hint or suggest such a byproduct. As such Applicants respectfully submit that Hao does not anticipate claim 19.

In light of the above, Applicants respectfully request that the Examiner withdraw this rejection.

Examiner rejected claims 1-19 under 35 U.S.C. 103(a). In particular, the Examiner stated:

Claims 1-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hao (US Patent No 5,966,586) in view of WO 99/16108.

It is noted that the claims were interpreted in the light of the specification as directed to the method of cleaning process chambers.

Hao teaches the claimed method except for determining the endpoint of the chamber cleaning process.

WO 99/16108 teaches a method of optical endpoint detection and teaches (page 3, line 31-page 4, line 6) that it was known to use the same endpoint methods for any plasma process including etching and chamber cleaning.

It would have been obvious to an ordinary artisan at the time the invention was made to use the method of Hao to determine endpoint of chamber cleaning process with reasonable expectation of adequate results because WO

99/16108 teaches that it was conventional to use the same methods for detection of endpoints of etching and chamber cleaning.

As to claim 5 Hao does not specify the use of Fourier Transform spectrometry. Hao teaches a number of optical methods, such as absorption, emission, combined, etc. It is believed that the disclosure of Hao encompasses Fourier Transform spectrometry.

On the other hand, WO 99/16108 teaches (at least on page 3, first paragraph) this method as a preferred optical method for end point control.

It would have been obvious to an ordinary artisan at the time the invention was made to employ Fourier Transform spectrometry in the method of Hao with reasonable expectation of adequate results because WO 99/16108 teaches this method as a preferred optical method for end point detection.

Applicants respectfully traverse the Examiner's rejection.

Hao. Hao has been discussed above.

WO 99/16108: Applicants respectfully submit that WO 99/16108 teaches utilizing an optical sensor (preferably, a Fourier Transform Infrared (FTIR) spectrometer) to develop gas composition profiles for the purpose of detecting faults. In particular, WO 99/16108 teaches comparing gas composition profiles for determining when processing equipment is not operating properly at p. 2-3. Further, WO 99/16108 discloses at p. 4 an apparatus wherein an FTIR instrument is coupled to an exhaust duct during plasma etching and chamber cleaning. As shown in FIG. 1, the beam of the spectrometer travels through the exhaust line between a turbo pump and a dry mechanical pump.

Regarding claim 1: Applicants respectfully submit that neither Hao nor WO 99/16108 teach, hint or suggest detecting a measure of absorbance of radiation by a cleaning byproduct by "detecting a measure of further radiation emitted by the byproduct in response to the radiation, detecting a measure of background radiation in the exhaust line, and the measure of absorbance of the radiation represents a difference between the measure of further radiation and the measure of background radiation." In fact, both Hao and WO 99/16108 teach away from claim 1 by teaching analysis of radiation that is directed through the exhaust line but is not absorbed by the byproduct. In addition, Applicants respectfully submit that neither Hao nor WO 99/16108 teach, hint or suggest determining the endpoint when the measure of absorbance falls within a predetermined window, wherein the predetermined window encompasses a value that corresponds to 100% cleaning of the chamber and less than 100% cleaning of a

predetermined portion of the exhaust line in accordance with claim 1. An important discovery made by the inventors in this regard relates to the discovery that the chamber is clean before all of the byproducts of cleaning have disappeared from the exhaust line. In addition, as is set forth at length in the specification, this discovery enables the chamber to be cleaned without overcleaning (and, thereby, introducing further particles). In fact, neither Hao nor WO 99/16108 address this issue at all. Specifically, Hao only teaches determining a predetermined amount of byproduct to end etching without providing any teaching as to how much cleaning this predetermined amount corresponds. In addition, WO 99/16108 only teaches determining a particular waveform which is used to indicate a fault. Thus, Applicants respectfully submit that even if one were to combine the teaching of Hao and WO 99/16108, one would not arrive at the invention of claim 1. As such, Applicants respectfully submit that claim 1 is patentable over Hao in view of WO 99/16108.

Regarding claim 2: Applicants respectfully submit that claim 2 is patentable over Hao in view of WO 99/16108 for the reasons set above with respect to claim 1 relating to determining the endpoint when the measure of absorbance falls within a predetermined window, wherein the predetermined window encompasses a value that corresponds to 100% cleaning of the chamber and less than 100% cleaning of a predetermined portion of the exhaust line.

Regarding claim 3: Applicants respectfully submit that claim 3 depends from claim 2 and, as such, Applicants respectfully submit that claim 3 is patentable for the reasons set forth above with respect to claim 2. In addition, Applicants respectfully submit that neither Hao nor WO 99/16108 teaches, hints or suggests detecting the endpoint for a dark cleaning process. As such, Applicants respectfully submit that claim 3 is patentable over Hao in view of WO 99/16108.

Regarding claim 4: Applicants respectfully submit that claim 4 depends from claims 2-3 and, as such, Applicants respectfully submit that claim 4 is patentable for the reasons set forth above with respect to claims 2-3. In addition, Applicants respectfully submit that neither Hao nor WO 99/16108 teaches, hints or suggests detecting further radiation emitted by the byproduct after absorbing radiation. In fact, as set forth above with respect to claim 1, both Hao and WO 99/16108 teach away from claim 4 by teaching analysis of radiation that is directed

through the exhaust line but is not absorbed by the byproduct.. As such, Applicants respectfully submit that claim 4 is patentable over Hao in view of WO 99/16108.

Regarding claims 5-7 and 9-10: Applicants respectfully submit that claims 5-7 and 9-10 depend from claims 2-4 and, as such, Applicants respectfully submit that claims 5-7 and 9-10 are patentable for the reasons set forth above with respect to claims 2-4. In addition, Applicants respectfully submit that neither Hao nor WO 99/16108 teaches, hints or suggests analyzing further radiation using Fourier Transform Raman spectrometry. In fact, as set forth above with respect to claim 1, both Hao and WO 99/16108 teach away from claims 5-7 and 9-10 by teaching analysis of radiation that is directed through the exhaust line but is not absorbed by the byproduct. As such, Applicants respectfully submit that claims 5-7 and 9-10 are patentable over Hao in view of WO 99/16108.

Regarding claim 8: Applicants respectfully submit that claim 8 depends from claims 2-6 and, as such, Applicants respectfully submit that claim 8 is patentable for the reasons set forth above with respect to claims 2-6. In addition, Applicants respectfully submit that neither Hao nor WO 99/16108 teaches, hints or suggests using a signal to determine an endpoint which is a predetermined multiple of a signal representing a measure of absorbance. As such, Applicants respectfully submit that claim 8 are patentable over Hao in view of WO 99/16108.

Regarding claim 11: Applicants respectfully submit that neither Hao nor WO 99/16108 teach, hint or suggest detecting a measure of absorbance of radiation by a cleaning byproduct by use of “a detector that selects further radiation emitted by the byproduct in response to the radiation and outputs a first radiation signal and selects background radiation in the exhaust line and outputs a second radiation signal.” In fact, both Hao and WO 99/16108 teach away from claim 11 by teaching analysis of radiation that is directed through the exhaust line but is not absorbed by the byproduct. As such, Applicants respectfully submit that claim 11 is patentable over Hao in view of WO 99/16108.

Regarding claim 12: Applicants respectfully submit that claim 12 is patentable over Hao in view of WO 99/16108 for the reasons set forth above with respect to claim 1.

Regarding claim 13: Applicants respectfully submit that claim 13 depends from claim 12, and as such, Applicants respectfully submit that claim 13 is patentable over Hao in

view of WO 99/16108 for the reasons set forth above with respect to claim 12. In addition, Applicants respectfully submit that neither Hao nor WO 99/16108 teaches, hints or suggests detecting an endpoint for a dark cleaning process.

Regarding claim 14: Applicants respectfully submit that claim 14 depends from claims 12-13 and, as such, Applicants respectfully submit that claim 14 is patentable for the reasons set forth above with respect to claims 12-13. In addition Applicants respectfully submit that neither Hao nor WO 99/16108 teach, hint or disclose “the detector comprises a filter that transmits the further radiation and a filter that transmits radiation in a band of wavelengths close to wavelengths of the further radiation.” In particular, neither Hao nor WO 99/16108 teach, hint or disclose filtering to select further radiation or filtering to select background radiation. As such, Applicants respectfully submit that claim 14 is patentable over Hao in view of WO 99/16108.

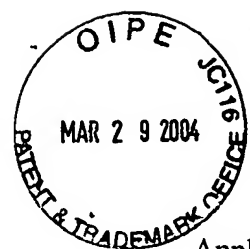
Regarding claim 15: Applicants respectfully submit that claim 15 depends from claims 12-14 and, as such, Applicants respectfully submit that claim 15 is patentable for the reasons set forth above with respect to claims 12-14. In addition, Applicants respectfully submit that neither Hao nor WO 99/16108 teaches, hints or suggests using an analyzer that comprises a Fourier Transform Raman spectrometer. In fact, as set forth above with respect to claim 12, both Hao and WO 99/16108 teach away from claim 15 by teaching analysis of radiation that is directed through the exhaust line but is not absorbed by the byproduct.

Regarding claims 16-19: Applicants respectfully submit that claims 16-19 depend from claims 12-15 and, as such, Applicants respectfully submit that claims 16-19 are patentable for the reasons set forth above with respect to claims 12-15.

In light of the above, Applicants respectfully request that the Examiner withdraw this rejection.

Examiner stated:

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 2002/0195423 is cited to show the state of the prior art with respect to methods and apparatuses for endpoint detection. See entire document especially Figures 1, 2, and the Endpoint Detection.



Applicants have reviewed the prior art of record and not relied upon, and
Applicants consider such prior art to be no more relevant than the references discussed above.

In light of the above, Applicants respectfully submit that all the remaining claims are allowable, and Applicants respectfully request that the Examiner reconsider the case and pass the case to issue. Should the Examiner have any questions or wish to discuss any aspect of the application, a telephone call to the undersigned would be welcome.

Respectfully submitted,
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